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Nor should that learned asp be wisely blamed,  
 Who with thy charm sweetly could minister ;  
 And if, O saint ! the race *has* sinned thro' thee,  
 Wigelia !—the compliment's a flattery !

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## THE TRUE AND THE FALSE IN DARWINISM.

### *A Critical Representation of the Theory of Organic Development.*

By Edward von Hartmann; Berlin, 1875. Translated from the German by H. I. D'ARCY.

[The Ideal and the Genealogical Relationship of Types, Continued]

When minerals, which crystallize according to the monoclinic or triclinic system, are spoken of, no one doubts that each crystal obeys in its formation the laws that inhere in it, and yet no one dreams of a real genealogical development. But when the animals of the radial and bilateral type are spoken of, a search is, at once, made for intermediate forms, which are regarded, not only as members of an ideal group, but as genealogical links, connecting one morphological type with another. And as, of course, there cannot be direct evidence of an actual transition from one form to another, we are cautioned as to our explanation of intermediate forms which actually exist, by a glance at the analogy presented by minerals ; and this caution is just as operative when we are convinced of the general truth of the theory of descent. Again, the readiness with which such a transition might occur among such intermediate forms does not strengthen the argument ; because if this were sufficient evidence of actual descent, we should be forced to maintain that the hyperbola is produced by the parabola, the parabola by the ellipse, and the ellipse by the circle or the straight line. The abundance of forms that closely resemble each other may be fairly regarded as the diversified working of one deeply seated universal cause, as well as an evidence of the actual development of one from the other, and both views are equally sound whether the process takes place in space or in space and time. Thus the goldfish, for instance, varies a deep yellow color with every possible mixture of black,

so that a perfect gradation can be observed from pure golden yellow to full black; but it would be premature to regard this gradation as a genetic one, as even experience shows that all such variations can be produced in one generation from the same pair.

But the above example, as should be borne in mind, refers only to varieties in which true genealogical development, to a certain extent, is attested by experience; and if the desired inference from the ease with which the ideal transition of intermediate forms can be conceived, to an actual genealogical connection, is, even here, obviously erroneous, surely double caution is necessary in our reasoning, when we consider the forms intermediate between the types of species or of orders, as in such cases experience gives no assistance. Even if we were convinced, *a priori*, of the necessity of real genealogical connection, yet the intermediate forms supplied by palæontology, though useful in filling up the lacunæ of systems, can never show that any given form, so supplied, has actually been a link of the supposed genealogical chain. Indeed, the sober advocates of the theory of descent have scarcely even viewed the question otherwise; but the Hotspurs of Darwinism continually demand of us to accept, at once, every proof of a series of ideally related forms as, *eo ipso*, sufficient evidence of a genealogical development in such series. As against such pretensions the warning, just given, does not seem superfluous, although it should, by no means, be denied that with every discovery of an intermediate form, with every filling up of a gap in the natural system, the probability of the theory of descent, in general, gains fresh strength, in so far as (on the supposition of a different foundation for it), the difficulties occasioned by the great breaks in the descent are lessened and removed. This has been specially emphasized by me (Ph. d. Unb. 8ter. Ed., pp. 598-601 and pp. 587-590).

Darwin, as is well known, utilizes, in his advocacy of the theory of selection, the results of artificial breeding, in which human intelligence plays a leading part, and the results of which are, therefore, in a certain sense, to be characterized as human products. Following this precedent, it will not be improper to examine and compare human products in a wider sense, of course under the same condition as Darwin, viz: that the agency of human intelligence is to be excluded from the strictly natural process. This consideration will at once serve to confirm the cau-

tion already derived from the glance at mineral types. If it is said, for instance, that the Gothic dome sprang from the Romantic, and the Romantic from the Basilica, and the Basilica from a kind of Roman market structure; if, further, the most obviously intermediate forms are pointed out, yet no one will conclude therefrom that a particular edifice of the Gothic style was produced by an actual change of the curved into the pointed. Of course, there is here a development of one type out of another, but only in an ideal sense, and not through the physical action of existing structures. That is, a real genesis can be traced, not, however, as an external, but as a psychological genesis of thought and artistic ideals, of which the one temporarily emanates from the other.

Now we should not suppose that this temporal genesis is to be found among the ideas that guide the processes of nature; for, if there are such ideas, they must be regarded not as temporarily springing from one another, but as ever existent; and the transitional forms among them can be intermediate only in a purely ideal sense. So long as the world was regarded as a Divine creation (and in principles Darwin still looks from this standpoint of the nineteenth century), so long must this analogy drawn from human productions possess a peculiar force. But even when the absolute spirit is regarded as realizing, in the processes of natural development, the immanent ideas of nature, it does not entirely lose its significance. This happens only when a purely mechanical view drives all ideas out of nature, and if we show the insufficiency of this view, for the explanation of the origin of species, we shall be forced to adopt the ideal one. The analogy of human productions, however, furnishes a valuable complement to that of the mineral types; for as the latter prove that in a natural system an ideal relation of types is possible, without genealogical relationship, and actually exists in nature, so the former introduce us to a domain where the relationships of concrete phenomena demonstrably spring from the ideal relationship of their types. And as the former warns us not to infer that the relationship found to exist in organic nature is the result solely of an identity of genealogical origin, so the latter demonstrates that the ideal relationship of types may as well be the precedent condition of the real genealogical connection, as of the similarity of concrete phenomena, without any genealogical agency. We, at least, learn from this that ideal and genealogical relationship can

exist side by side, and that it is entirely premature to seek to establish, from the proof of the latter, a ground for the denial of the former. Rather should we regard genealogical relationship as one of nature's means for the creation of ideally related types, while that found in the mineral kingdom (resulting from the law of development inherent in the typical crystal-form) is another, and, besides this, perhaps others could be imagined.

The weight of these considerations is increased when we remember that, even in the domain of organic nature, relationship is to be found among types, which does not proceed from a physical change of one into the other. In a wider sense even the variations already alluded to might be here instanced, although, on the assumption of actual descent, the difficulty would lie not in the resemblance but in a difference, which, by reason of its peculiar character, presents the appearance of a genealogical series. It is, however, a more important and decisive fact that in the parts of the system more remote from each other, ideal relationships present themselves which cannot possibly be referred to a common descent, because they are in every case developed in each type at a period later than that at which the latter have been thrown out from a common root. Darwin calls this resemblance an analogous, as distinguished from a real, that is, a genealogical one, as, for instance, the resemblance of the whale to the fish, and of the mouse to the shrew-mouse, and the similarity in the formation of the pollen between the orchidaceæ and the asclepias; and erroneously relies, in explanation, upon the principle of adaptation to similar conditions of life as a sufficient cause. Now, among apes, the gorilla resembles man most in his foot, the orang-outang resembles him most in his brain, and the Chimpanzee in his form; it would yet be entirely unwarranted to maintain, from one of these resemblances, the descent of man from this or that species of ape. But, on the contrary, the existence among the different kinds of apes, of these resemblances to man, would go to show that the common progenitor of apes and men did not possess these peculiarities, and that they were independently developed in the different types. We must, therefore, be very cautious in basing our assertion of a close genealogical relationship upon special likenesses of types; for instance, Gegenbaur, though himself a follower of Darwin, shows the futility of the attempt to argue from the ideal relationship between the carpus of birds and that of crocodiles, that the form-

er proceeded from the latter ; and says on this point (Studies in the Comparative Anatomy of the Vertebrate Animals, vol. 1, p. 39), "Such relationships are to be found also between birds and other reptiles, without our being able to decide what resemblance justifies the recognition of a close relationship." Only on especially important likenesses should we rely ; but what is the limit at which a likeness becomes important enough to indicate a genealogical connection ?

It is, therefore, not to be wondered at that the genealogical trees presented by Darwin and his followers, vary according as relationship is made to depend upon this or that resemblance. But even this is to be borne in mind that if the most important resemblances were actually discovered and the genealogical tree truly represented, yet in every instance a host of less important resemblances which establish an ideal relationship would find no expression, as only genealogical relationships are there represented. In other words, the genealogical tree cannot fully represent all the ideal relations of the natural system, because the latter are much more numerous and complicated than mere genealogical relationship, which is necessarily limited to simple and direct connection. This fact can be expressed by saying that the linear representation of the simple genealogical tree is not a sufficient representation of the natural system, because it cannot represent complex and multiplied relationships.

Such complex relationships exist where in a series of types the first has a common characteristic with the second, the second with the third, and so on to the last, which has a characteristic in common with the first. Under such circumstances it is very difficult to decide upon the best way of representing the natural system by a genealogical tree ; and wide deviations from the truth, when so deciding, are excusable and almost unavoidable. But the task is even more difficult in the case of the more complex relationships in which those mentioned are merged when among the separate members of the series still other resemblances are found. In appendix No. 5, Wigand treats in a most exhaustive manner of the very common snail, *Neritina Virginea*, and represents on page 412 the whole complex relationship of the fourteen principal types. Whether these types are to be regarded as varieties, according to Wigand, or whether, as some claim, other species are to be included in them, is to the advocate of the mutability of the human species entirely immaterial. It is,

in my view, clearly shown by this example that a multitude of types possess relationships far too complex to be represented or explained by the mere principle of the similarity of types by means of genealogical connection; for every type is related not only to one, but to several; indeed, most of the others, and this, not only in one, but in two or more points. Now this complex relationship is not represented by the ramification of the genealogical tree, in which there is only one relationship. To do this would require a system as complex as that of the veins in a leaf or, better still, one using the third dimension also. The natural system is, in part, like a table with a twofold or a threefold index, where, according as we proceed upon one principle or another, the types arrange themselves in entirely different groups. The whole distinction between the classification in a natural system, and that in an artificial one is based upon this many-sidedness of ideal relationships, which is not even thereby fully shown.

Genealogical development, as is obvious, can only be traced along one of these many lines of relationship, and it follows that all the other relationships must have been developed by some natural agency other than a genealogical one: that is, the resemblance to be met with must have been independently developed in the different branches of the genealogical tree. And as this systematic relationship depends upon resemblance just as genealogical relationship does, it is clear that even in the case of types of organic nature, simple relationship by no means justifies the assertion of genealogical connection, either by the immediate descent of one type from another, or by the descent of both from one already possessing the common feature. If the theory of selection could account for the morphological character of types, and the real question is now as to this character, we might think of perfecting, with the aid of such theory, the explanation of systematic relationships given by the theory of descent; but, since it cannot do this, as we shall see, we must come back to the inner development of organic life, according to law, by means of which are developed ideal types with inherent mutual relationships. Even genealogical development itself is included in this organic development, according to law, and serves it as one of nature's means for the realization of ideas, beside which there are still other ways and means.

The term "descent" is by no means a shibboleth by which all development according to law is excluded, and all the wonders of

systematic relationship fully explained, as the results of genealogical connection. So long as every attempt to explain the resemblance of organic types by the principle of descent was successful, we could refuse to recognize the force of analogies drawn from inorganic nature and from human productions; but now, since we acknowledge the insufficiency of this explanatory principle, even for organic nature, we must cease to argue from an ideal relationship, as such, to a genealogical one. For, however seductive such a method may appear, it yet rests upon untenable grounds:\* and if the theory of descent is to be established as even one of the agencies for the realization of nature's ideas, and shown to be a justifiable hypothesis, still the defence of it must be derived from some other source than a reference to systematic relationships and the connection between these and the palæontological and embryological.†

The true reasons which constitute the theory of descent an incontrovertible hypothesis, have been briefly given by me in my *Phil. d. Unb.* 8ter. Ed., p. 582. These are to be found in the simple consequences of the two indisputable propositions: "Omne vivum ex ovo; omne ovum ex ovario." Even the advocates of the immediate origin of species by special acts of creation, cannot explain this creation, in connection with the totality of nature, in any other way than as the creation of an egg of the particular species in the ovary of another and, presumably, a nearly related species. Only so long as no one considered attentively the manner in which God had created the different species in the different

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\*The perfectly true proposition, "similarity of descent causes similarity," cannot be converted into "similarity depends upon similarity of descent." Wigand. "The Genealogy of Primitive Cells," Braunschweig, 1872, p. 47.

†It may be here incidentally remarked, that no argument from analogy can be derived from the genealogical relationship of languages of the same stock, in support of the genealogical relationship of specific types; for speech, like the song of birds, represents only one side of human instinct, but human beings whose languages are related, always belong to a branch of the same variety, and never to different species. Could such an argument be drawn from the genealogical development of languages to that of specific types, it would rather tend to show that a genealogical connection was no more to be assumed between different species than between the different language-stocks. Of course such reasoning would be devoid of force; but this should suffice to show that it would be just as devoid of force if it were, accidentally, favorable the opposing view. Compare Wigand, pp. 358-364.



geological periods, could one be satisfied with the expression "immediate creation;" we children of a new era have no choice as to accepting or rejecting the theory of descent; we must accept it, because we can no longer defend the wonders of creation in all its crudity, such as the fashioning out of clay, and the breathing in breath, etc. In the process of nature, the newly arising species must, so far as they differ from the primitive organization, just produced by original creation, be descended from parents, of course, in some degree different from them. Although, therefore, the descent of all organic types from antecedent ones is an unavoidable necessity, yet is it reasonable enough to suppose that an agency may be used for the realization of the ideal relationship of nature's types, which is not exclusive of all others. Ideal relationship needs other ways and means for its realization beside genealogical relationship; the latter does not, as the followers of Darwin believe, exclude the former, while acting in its stead, and is, indeed, contained in it as the species is in the genus.

(To be Continued.)

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## HEGEL'S RELATION TO HIS PHILOSOPHICAL CONTEMPORARIES; SCHELLING, BAADER, KRAUSE, HERBART, SCHOPENHAUER.

Translated from the German of Karl Rosenkranz, by GEO. S. HALL.

To those who are accustomed to read in the histories of German literature that Hegel corrupted his native language by the use of an unpardonable jargon, it must seem absurd to represent him as a German classic writer. If literary reviewers had read even his educational addresses or his criticisms, they would have hesitated to express such opinions; but they have based their judgments only upon scraps which they have excerpted from some encyclopædia article, or often from an anthology, in order to frighten away the reader from the study of such an abstruse corruptor of its language. In order to furnish grounds for the justness of the view here taken, determined as it is by